DOCUMENT RESUME

ED 145 938 PS 009 611

AUTHOR Drash, Philip W.; Stolberg, Arnold L.
TITLE Acceleration of Cognitive, Linguistic and Social Development in the Normal Infant.
SPONS AGENCY Florida State Dept. of Health and Rehabilitative Services, Tallahassee.
PUB DATE 77
NOTE 12p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Behavior Change; *Child Development; *Developmental Programs; Early Experience; *Infants; Intellectual Development; Language Development; *Parent Education; Preschool Education; Program Effectiveness; Research; Social Development

ABSTRACT

This pilot study trained parents in behavior modification techniques and attempted to evaluate the impact of this training on the rate of cognitive, linguistic and social development in infants. A second goal was to identify significant areas in infant development which might be influenced by the teaching strategies used. Subjects were four first-born Caucasian infants whose parents were married at the time of involvement with the program. Parents participated in weekly parent-training sessions. The regular 3-hour schedule included a review of observed changes in motor, intellectual and linguistic behaviors, the modeling of behavioral procedures by the staff and lectures and discussions on aspects of infant development. Measures of intellectual, speech and social development were administered prior to discharge from the treatment program and one year later. Results indicated that infants' intellectual and social growth were enhanced by the program. Developmental areas amenable to the parent teaching program were intellectual skills, motor skills, expressive and receptive speech, social skills, and compliance with verbal commands. (SB)

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ACCELERATION OF COGNITIVE, LINGUISTIC AND SOCIAL DEVELOPMENT IN THE NORMAL INFANT

PHILIP W. DRASH, PH. D., and ARNOLD L. STOLBERG, M.A.

FLORIDA MENTAL HEALTH INSTITUTE

and

DEPARTMENT OF PSYCHOLOGY

UNIVERSITY OF SOUTH FLORIDA

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Acceleration of Cognitive, Linguistic and Social Development

In the Normal Infant

Intellectual development is said to be a non-additive interaction between heredity and environment (Anastasi, 1958). And the influence of genetics, Anastasi argues, is always indirect. Hereditary factors simply set the extreme limits for the overt behaviors.

As many as 75 per cent of all cases of retardation do not involve inherited organic defect or cortical impairment due to trauma. (Joint Commission on Mental Health of Children, 1973; Zigler, 1967). Zigler (1967) argues that this functional retardation results from a lack of adequate intellectual stimulation. And Drash and Liebowitz (1973) present evidence which implies that the prognosis for remediation becomes more bleak as the child passes the age of three.

Prevention, it appears, is the only viable treatment strategy. Training in parenting procedures may prove to be an effective vehicle for intervention. In addition to the theoretical support for this perspective provided by the environmental stimulation literature is the data presented by Drash, Solomon, Long and Stolberg (1976) which demonstrates the effectiveness of parents as treatment agents in the modification of hyperactive behaviors in preschoolers.

The goals of this pilot study were to:

1. evaluate the impact of parental training in behavior modification procedures on the rate of cognitive, linguistic and social development in the infant, and to

2. identify significant areas in infant development which may be influenced by such teaching strategies.

Effectiveness of treatment was evaluated in terms of cost, time and relative standing on important areas of behavioral and intellectual development.

METHODS

Subjects:

Subjects were four first-born, Caucasian infants whose parents were married at the time of involvement with the program. Three were six months of age upon admission. The fourth was three months upon entrance to the program. The older children participated in the program for seven months and the youngest, for five months.

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Insert Table I

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Measures:

INTELLECTUAL DEVELOPMENT: Intellectual development was assessed by the Cattell Test of Infant Intelligence and the Stanford-Binet Test of Intelligence. The Cattell was used for children younger than two years and the Stanford-Binet, for those older than two years.

SPEECH DEVELOPMENT: The Infants' speech functioning was assessed by the attained developmental level as articulated by Drash and Liebowitz (1973).

SOCIAL DEVELOPMENT: The Vineland Test of Social Maturity was used to evaluate the infants' rate of social development. An analysis of the items on the Vineland indicated that this assessment tool primarily measures self-help skills. The Behar Preschool Behavior Questionnaire was used to evaluate those social skills required in interpersonal interactions.

Procedures:

The treatment program consisted of weekly parent-training sessions. The regular three-hour schedule included a review of observed changes in motor, intellectual and linguistic behaviors, the modeling of behavioral procedures by the staff and lectures and discussions on aspects of infant development.

RESULTS

Intelligence tests administered prior to discharge from the treatment program indicated that all infants were functioning within the superior range on the Binet or Cattell. Scores ranged from 123 to 143 with a mean of 136. Follow-up scores revealed that this early strength endured through the year following treatment. All infants scored at the superior level with IQ's ranging from 135 to 154 with a mean of 145 at the recent one-year follow-up testing session.

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Insert Table 2

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Speech was judged to be at least one year above age level in three cases and at the expected age level for the fourth infant. The linguistic repertories of the three advanced children were between 500 and 700 words at twenty-five months. This included the regular use of 3 to 10 word sentences. Mean Speech "quotients" for all subjects were at the superior level varying from 100 to 176 with a mean of 149.

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Insert Table 3

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Self-help skills, as assessed by the Vineland were judged to be at the superior level for all infants. Social quotients were from 128 to 192 with a mean of 169.

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Insert Table 4

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Scores on the Behar indicated that all infants were functioning at average levels on most scales. Total disturbed behavior and hyperactive and distractible behaviors were within normal limits on all cases. Hostile and aggressive behaviors strayed from normal in two cases. Those children were at the eightieth and eighty-fifth percentiles. Anxious behaviors were within normal limits in three cases. One child was at the nintieth percentile.

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Insert Table 5

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DISCUSSION

The results of this pilot investigation were consistent with those of previous studies (Gordon & Guinaugh, 1974; Gordon, 1974). Training new parents in behavior modification procedures and child development principles enhanced the infants' intellectual and social growth. Several potential benefits were suggested by this quasi-experimental, preventative program.

The outcome of this project appeared to be positive. Durable gains in IA and speech, self-help and interpersonal skills were suggested. Mean scores on all measures of the previously cited behavioral areas were significantly above

the established age-norms.

In terms of personnel, dollars and time, the realized benefits were relatively inexpensive. Three staff members were involved in the operation of the program. Initially, the time required was one, three-hour session per week. This decreased to one session per month as the discharge date neared. Although only four infants were included in this study, twice as many might be served in a program focusing exclusively on service.

Information on developmental areas amenable to this sort of teaching program was perhaps the most valuable result of this preliminary investigation. Training procedures, including the demonstration of behavior control techniques, the operant conditioning of speech, and motor and problem solving exercises, and indicated five primary areas for future investigation. They were:

1. intellectual skills,
2. motor skills
3. expressive and receptive speech,
4. social skills, both self-help and interpersonal, and
5. compliance with verbal commands.

Of particular interest were anecdotal reports which indicate (that compliance first became a problem at approximately seven months. At this time, the child first learned a means of self-locomotion. Subsequent problems with non-compliance were reportedly averted by the early identification of one parent as an effective disciplinarian.

The aforementioned project differed from the traditional infant stimulation programs found in the literature (Gordon, 1974; Gordon and Guinaugh, 1974). The current program employed the parent as an intervention agent and focused on teaching that person behavior modification procedures and important

child development principles. Programs such as Gordon's (1974) involve stimulation of the child by the staff.

A recent report by the American Association for the Advancement of Science (1977) stated that increments in IQ and academic performance gained by participation in Project Head Start were more durable when the characteristics of the parent involvement were modified. Attention to parent behaviors which was provided by this prevention strategy might yield have long-lasting gains than those of the infant-focused programs.

Results of this project are inconclusive due to the lack of adequate control and/or time-series assessments. However, potentially valuable paths for further study in the area of the prevention of mental disorders, such as functional retardation, were highlighted by this pilot effort.

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TABLE I

SUBJECTS

INITIALS	SEX	D.O.B.	INITIAL CHRONOLOGICAL AGE IN MONTHS	MONTHS IN PROGRAM
1. N.W.	F	3/12/75	6	7
2. R.T.	M	3/19/75	6	7
3. K.L.	F	3/22/75	6	7
4. V.T.	F	8/19/75	3	5

TABLE 2

INTELLECTUAL DEVELOPMENT

INITIALS	SEX	CATTELL I.Q. UPON DISCHARGE	BINET I.Q. AT ONE-YEAR FOLLOW-UP (approx chronological age 2 years)
1. N.W.	F	136 (16.4)/(12.0)	154 ** (42.0)/(25.0)
2. R.T.	M	135 (16.3)/(12.0)	135 (33.0)/(23.0)
3. K.L.	F	123 (14.8)/12.0	150 ** (41.0)/(25.0)
4. V.T.	F	143 (10.0)/(7.0)	142 * (28.4)/(20.0)
Mean		136	145

* Cattell
** Obtained through Parent Report

TABLE 3

SPEECH DEVELOPMENT AT FOLLOW-UP*

INITIALS	SEX	SPEECH LEVEL	EXPRESSIVE SPEECH	SPEECH DEVELOPMENT AGE
1. N.W.	F	19	6-7 word sentences ~700 words	44 months (176)
2. R.T.	M	16	3-4 word sentences ~500 words	36 months (144)
3. K.L.	F	19	6-10 word sentences ~700 words	44 months (176)
4. V.T.	F	10	1 word sentences ~100 words	20 months (100)

*Based on Speech Development norms in Drash & Leibowitz (1973))

TABLE 4

VINELAND SOCIAL DEVELOPMENT -(AT FOLLOW-UP)

INITIALS	SEX	SOCIAL QUOTIENT	SOCIAL AGE
1. N.W.	F	128	32 months
2. R.T.	M	192	48 months
3. K.L.	F	192	48 months
4. V.T.	F	165	33 months
Mean:		169	40.3 months

TABLE 5

PSYCHOLOGICAL DEVELOPMENT AT FOLLOW-UP
Percentile Rank on the
(Behar Preschool Behavior Questionnaire)

INITIALS	SEX	TOTAL* BEHAVIOR DISTURBED	SCALE I HOSTILE-AGGRESSIVE	SCALE 2 ANXIOUS	SCALE HYPERACTIVE DISTRACTIBLE
1. N.W.	F	65	80	65	50
2. R.T.	M	25	50	50	50
3. K.L.	F	65	85	65	30
4. V.T.	F	65	65	90	65
Mean:		55	70	67.5	43.8